NDC-F16
Access Control Panel

Installation Manual

NDC-F16

A C C C E S S C O N T R O L P A N E L

This manual covers installation, programming and utilization of NDC-F16 access control panel. Read this manual carefully prior to installing and programming the unit.

Design Change Disclaimer

Due to design changes and product improvements, information in this manual is subject to change without notice. ITV reserves the right to change product design any time, which may subsequently affect the contents of this manual.

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Integrated Technical Vision Ltd performs training on the installation, programming and utilization of NDC-F16 access control panel. For additional information about training and discussing of your particular requirements to the unit please contact our personnel by the phone numbers below.

It is recommended to pass the training in Integrated Technical Vision Ltd to personnel intended for sales and installation of NDC-F16 access control panel on permanent basis. Technical support for all products of Integrated Technical Vision Ltd can be obtained at business time by the phones below:

+380 (0) 44 248 65 88

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This support assumes the calls of trained specialists. End users must apply to their dealers or installers before calling us.

This information is available on our web site www.itvsystems.com.ua

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Preface

NDC-F16 access control panel is designed for use in access control systems. Primary goals of Access Control System are: identification of a person, confirmation or not confirmation of access, control of movements in a necessary zone. It can provide time and attendance logging, in addition to the usual task of restricting individuals' access to certain areas.

All users' access information is gathered by a server, where administrators can retrieve and analyze it. This data provides recording of staff movement within an organization, whether it is a small company or a company that employs thousands.

NDC-F16 panel operates as a total stand-alone unit with fully distributed database. All valid card numbers, time zones and relay pulse times are loaded into controller's memory. The panel controls access to two doors on a stand-alone basis with no dependency on central computer system. Up to 32 control panels may be connected on RS-485 dropline.

Features

- o Supports all Wiegand reader technologies
- o Distributed database for independent operation
- o Operates in remote site configurations with dial-up (requires NDC-B052)
- o Up to 8,000 card memory
- o Up to 16,300 buffers
- o 4-wire RS-485 communications, protection rated at 3000 V
- o RS-232 communication port for local programming
- o 8 supervised programmable inputs
- o Tamper switch contact
- o 2 Form C relays
- o Two transistor outputs
- o Up to 255 time zones to control card access
- o Local antipassback function

Specifications

Inputs 8 programmable EOL supervised inputs
Outputs Two 1 A @ 24 V relays
Open collector output 0.6 A @ 12V
Energized transistor output1 A @ +12V
Networking RS485 interface
Input Voltage +10…15 VDC
Voltage ripple 500 mV @ 12 V
Power consumption
Mains Power (maximal) 25 VA
Standby current @ 12V 40 mA
Maximal current @ 12V 120 mA
Operation temperature 0 C … +55 C;
Relative Humidity 95% relative at +25 C;
Nonvolatile memory capacity, depending on panel type is shown in table below:

Capacity	Type		
	NDC-F16-1	NDC-F16-4	NDC-F16-8
Identificators	1024	4096	8000
Events	1920	8064	16300
Time zones	100	250	250
Schedules	100	250	250
Holidays	190	250	250

Terms

Access point

Access point is a logical concept of the access control system implying the control of passing through the door in one direction. It consists of reader, access control panel (or it's part), door supervision devices (like magnetic contact, RTE etc.) and door locking device. For instance, the turnstile with two way passes has two **Access points** – one for entrance and the other one for exit, door of this type is called *double-sided* door. A door with the reader on one side has only one **Access point** – Entry point, and it is called *single-sided* door.

Antipassback

The Antipassback function is implemented in theNDC-F16PS access control panel in order to prevent the situation when user gives his ID to another person after passing to the premises. If this function is on, NDC-F16PS tracks an ID position – Inside or Outside the premises. On any attempt to pass in the same direction twice NDC-F16PS denies access and stores "Access Denied, Anti-passback" event into the Log.

The antipassback function can be set on, only in case of the double-sided door control.

Code matching

NDC-F16PS can arise alarm in case of an attempt of a code (or ID) matching. The Code matching is considered when invalid code (or ID) entered several times. Valid code entrance clears the counter. This function switching on and number of code entrances are subjects of programming.

Door Contact (DC)

In access control systems various sensors are used to supervise the status (opened or closed) of the pass way – magnetic door sensor, sensor of the turnstile rotor position, inductive sensor of car passing through the road barrier, etc.

The Door Contact terminal ofNDC-F16PS is intended for connection of these sensors.

Door time

If the door contact is open, the corresponding access point goes into alarm. Alarm is not invoked, if the contact is opened during the Door Time interval of time. This interval starts when access is granted and lasts for the programmed time or terminates on opening and subsequent closing of the door contact.

Downloading

NDC-F16PS is to be downloaded after setting all parameters – modes of inputs, outputs, access rights and others on the computer. During the downloading parameters are rewritten into the access control panel. If you change control panel parameters in your computer, they will not take effect until this parameters downloaded into the control panel.

PIN (Personal Identification Number)

Some readers have built-in keypad. The keypad may be used to enter ID in this case. Usually this ID is named PIN (Personal Identification Number). It can be both self dependant or used as an additional code for ID. When this PIN is g.

programmed as additional code, NDC-F16PS waits for PIN entrance after the ID read-out. PIN is associated with ID.

Proximity Identificator

In access control systems each user has ID (identificator) with the unique code. Proximity ID's may be in shape of plastic card, key trinket, etc.

Reader

Readers are devices assigned for reading information from ID's and transmitting it to the control panel

There are several types of ID's and readers for them. It is essential that reader and control panel should use the same interface. NDC-F16PS utilizes Wiegand interface.

RTE (Request to Exit)

To exit from the premises with a single-sided door, the button wired to the control panel is used. This button is called RTE (Request To Exit) button. If someone opens the door otherwise than pressing the RTE button – by re-energizing locking device, opening lock with a key etc., the Door Forced Open event arises.

RTE button may be used for remote door opening as well.

Schedules

NDC-F16PS is capable to store up to 100 time zones. 100 week schedules can be combined from these time zones, including 70 holidays.

Moreover NDC-F16PS can store several "floating" schedules, based on the period different to a week. The number of such "floating" schedules depends on the period length.

"Several ID's" access

To access the high security premises the presence of more than one person may be required . NDC-F16PS allows assigning of up to 15 groups of people with the access rights. The access is granted only in case when one person from each group is present. For instance you have the room which can be attended only by the personnel of R&D department escorted with guard. You can form two groups for this access – group of R&D employees and group of guard. The access is granted if two ID's from different groups read on panel readers – one belongs to the R&D department employee and the other one – to a guardian.

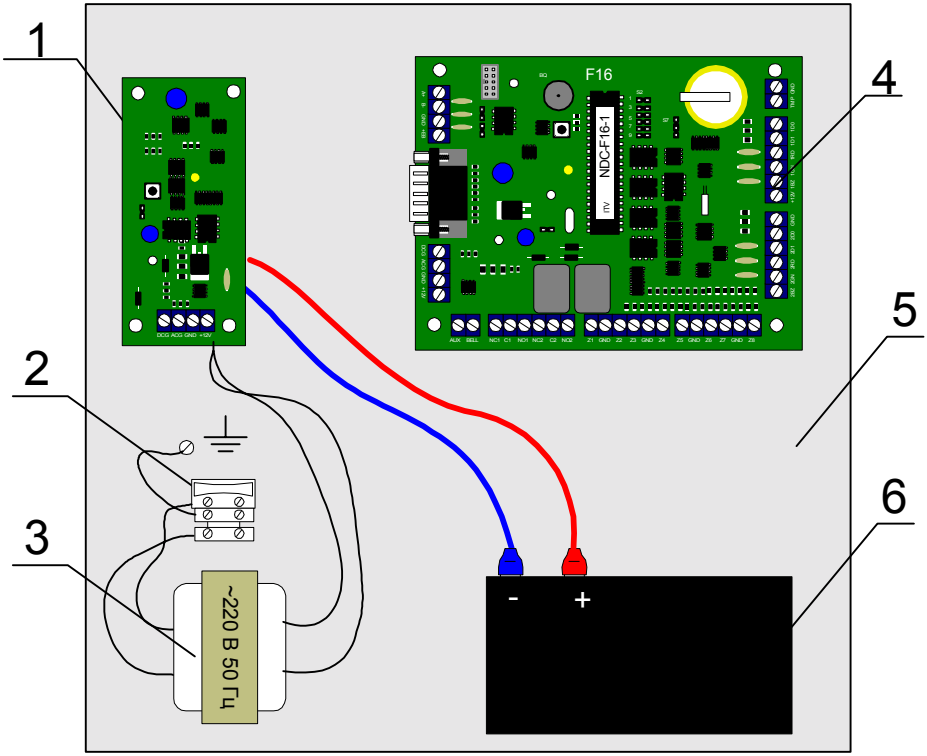
Time zone

Any interval of time which has the beginning and the end.

What's inside

The layout of NDC-F16 is shown on picture below.

Figure 1 View of the Panel inside the box:



1 - Power supply unit;

2 - Mains power connection terminal with fuse;

3 - Transformer;

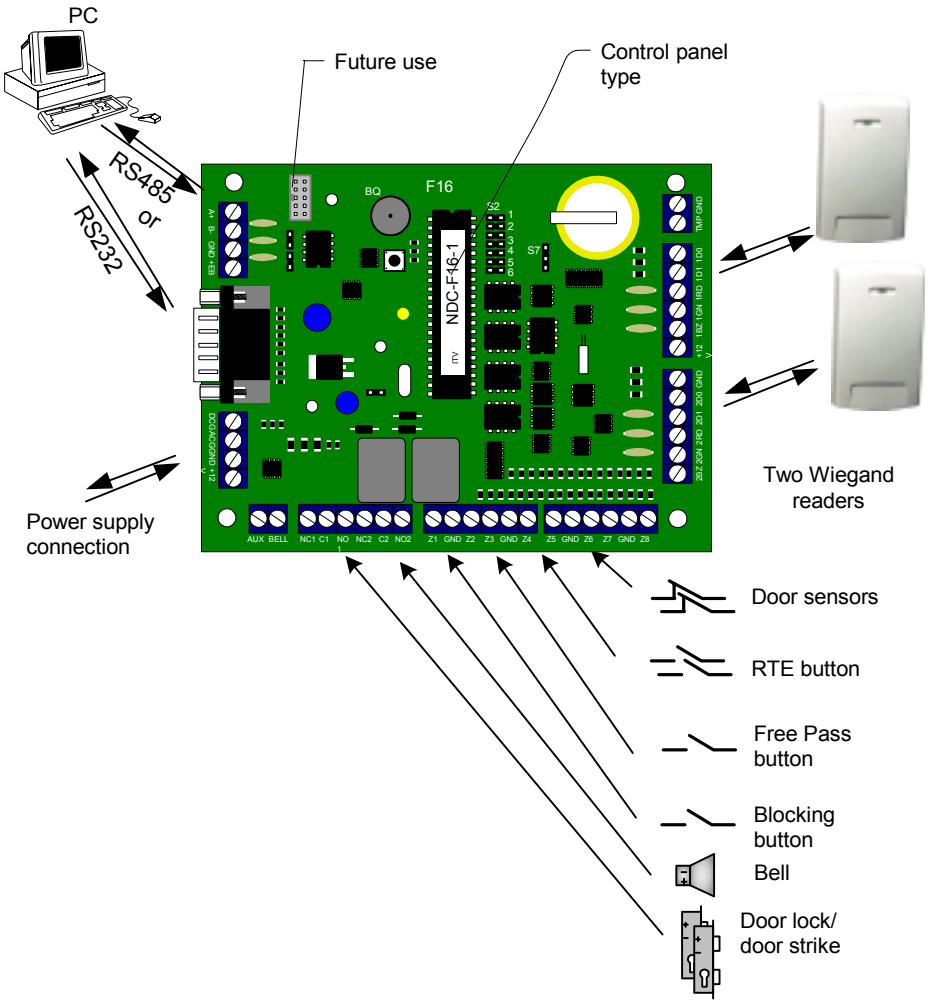
4 - Control panel mainboard;

5 Box;

6 - Rechargeable battery

Wiring diagram

Figure 2 NDC-F16 access control panel wiring



Controls and connections on the board

Terminal assignment

Terminal	Name	Function
A-	RS485-A-	RS485 dropline
B+	RS485-B+	
GND	GND	
+EB		
DCG	battery normal	Power supply connection
ACG	power normal	
GND	GND	
+12V	+12V	

AUX	Auxiliary power supply	Programmable transistor output
BELL	Bell	

NC1	Normally closed	Relay 1 contacts
C1	Common	
NO1	Normally open	
NC2	Normally closed	Relay 2 contacts
C2	Common	
NO2	Normally open	

Z1	Z1	Z1-Z4 EOL supervised inputs
GND	GND	
Z2	Z2	
Z3	Z3	
GND	GND	
Z4	Z4	

Z5	Z5	Z5-Z8 EOL supervised inputs
GND	GND	
Z6	Z6	
Z7	Z7	
GND	GND	
Z8	Z8	

2BZ	Buzzer	Reader B connective terminals
2GN	green LED	
2RD	red LED	
2D1	data 1	
2D0	data 0	
GND	GND + 12 B	Readers' power supply

+12V		
2BZ	Buzzer	Reader A connective terminals
2GN	green LED	
2RD	red LED	
2D1	data 1	
2D0	data 0	

TMP	TMP	Tamper contacts
GND	GND	

Connectors

- X3 - Not Used - for future use
- X11 - RS-232 communication port

Jumpers and LED

- S1 - Reset jumper
- S2 - Address
- S3, S4, S5 Jumpers for RS-485 load selection
- S7 - Real-time clock power switch.
- LED - Live function indicator (Yellow)

Jumper S7 should be set to lower position during panel installation and to upper position for storage and transportation to avoid lithium battery discharge.

Control Panel Operation

Control panels are supplied unprogrammed. In this state reader's LEDs do not light. Yellow LED situated on PCB blinks 5 times per second. Panel does not respond to cards passing and inputs opening and closing. The panel should be downloaded to start the operation with DC Configurator or Golden Gate program.

Yellow LED starts to blink one time per second and switches to the main mode automatically after successful settings downloading.

Panel can be turned to unloaded status only with command from PC, see programming instruction.

Panel can control two independent access points. Each access point may be in one of the four modes: main mode, alarm, blocked or free pass. Free pass mode has the highest priority, as panel switches to this mode in case of fire, then blocked, alarm and main modes follow.

Main Mode

Panel grants or denies access to cardholders in this mode. In main mode reader LEDs blink red.

Access with ID

To access the premises cardholder passes RF ID to reader. If it is valid, panel grants access, unlocks the door and switches on green LED of the reader.

Access with ID and PIN

To access the premises cardholder passes RF ID to the reader. Panel checks up the necessity of PIN entry, and, if it is necessary, reader's LED blinks yellow, which means PIN is awaited. After valid PIN entry door is unlocked. Reader's LED lights green.

RTE button

To exit from the premises with single-sided door, user has to depress (press and release) Request To Exit button. Reader's LED lights green.

Access Denial

Access may be denied to cardholder for the following reasons:

- Panel was not downloaded (reader's LED does not light or blink)
- ID was not enrolled in panel (on ID passing panel switches reader's red LED and buzzer for 1 second)
- ID expired (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Access is not allowed according to the schedule (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Antipassback violation (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Lost or Blocked ID passed (on ID passing panel switches reader's red LED and buzzer for 1 second)
- Access point is in alarm mode (reader's red LED lights constantly)
- Access point is in blocked mode (reader's red LED lights constantly)

Alarm Mode

In alarm mode reader's red LED lights constantly.

Access point goes into alarm mode for following reasons:

- In case of door ajar
- Panel box tampering (both Access points)
- Attempt of access with lost ID
- If door is opened too long (door time expired)
- In case of attempt of code matching (if switched on during programming).

In alarm mode the panel activates outputs assigned for BELL and ALARM. Alarm output is deactivated when panel switches into the mode different from alarm mode and BELL output is deactivated after programmed time.

If access point is in alarm mode to pass through this point is prohibited. RTE button unlocks the door.

To switch alarm mode off, pass card with "Alarm OFF" sign or with command from computer.

Free Pass mode

Sometimes the conditions arise when door should be opened for free pass for everyone, in case of fire, earthquake or other disaster, for instance. For this case panel has free pass mode.

In the free pass mode reader's LED blinks red and yellow alternately.

Access point switches into free pass mode at operator's command or when input, programmed as "FREE PASS" is open. Access point remains in free pass mode until this input is open or until operator cancels this mode.

While Access point is in free pass mode the locking device is in unlocked state and panel does not respond to ID passing, PIN entry or RTE button depressing.

Blocked mode

The blocked mode is designed for situations when access to the premises should be prohibited for everyone, in case of security alarm for instance. When access point is in blocked mode access is granted to cardholders of IDs with "Security Service" sign. Door cannot be unlocked with RTE button.

When access point is in blocked mode reader's LED blinks red and green alternately.

Access point switches into blocked mode by operator's command or when input, programmed as "BLOCKING" is open. Access point remains in blocked mode until this input is open or until operator cancels the mode.

Mounting

NDC-F16 is delivered in the rugged metal box with rechargeable battery. Mount the panel in place, convenient for service.

To mount the panel on wall proceeds as follows:

- Open box cover, place the box in the required position on a wall and mark the holes for mounting screws, using backplate as a template;
- pass the wires through the holes on a back plate,
- fasten the frame,
- connect the wires.

While installing the panel, before programming, set the jumper S7 into the lower position. Set it into the upper position for long-term storage and transportation.

Wiring

Readers' connection

NDC-F16 has two sets of terminals for Wiegand readers' connection. The wiring is shown on Figure 3 Reader connection.

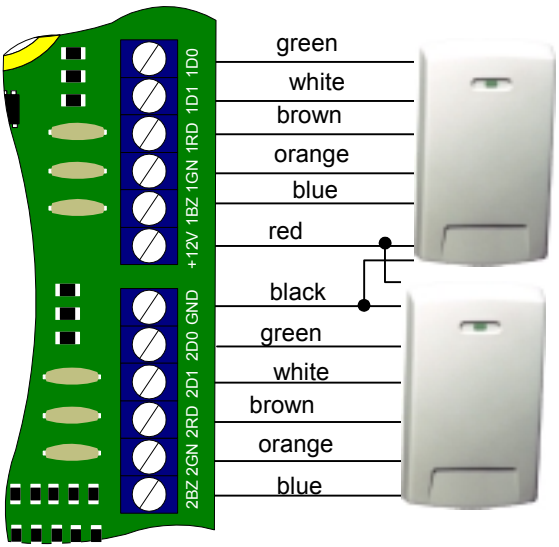
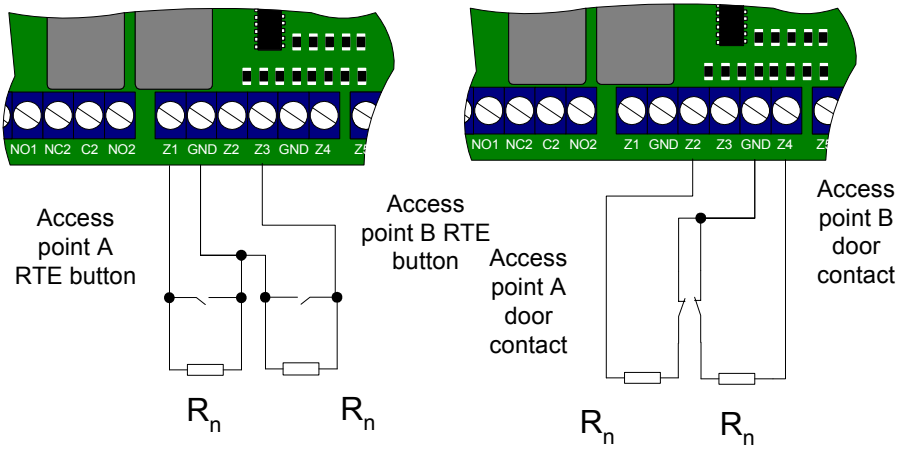


Figure 3 Reader connection

The wires' colours can differ in readers from other manufacturers. Please refer to reader's Installation manual.

Inputs' wiring

NDC-F16 has eight EOL inputs. Inputs are programmable - see details in Golden Gate or DC Configurator software manual. After reset to factory defaults all inputs become unassigned and not supervised. All inputs supervise shortage and break. The EOL usage is mandatory.



RTE button

Request To Exit (RTE) button is to be used for one - sided door. In this case the door opens on depressing of RTE button for exit.

RTE button may be used for remote door opening - secretary or guard can open the door, for instance.

On the diagram to the right wiring of normally opened RTE button contacts is shown. RTE is wired to Z1 and Z2 terminals.

Usage of the deblocking button on the electric lock instead of RTE will cause "Door Forced" event.

Door Contact

Door state (opened or closed) is determined by the status of door contact. If door contact is not connected, the panel is not able to determine the events of door force or not closed door.

The wiring of door contacts to Z2 and Z4 terminals is shown on wiring diagram.

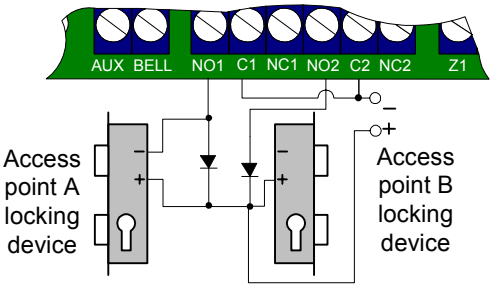
Free Pass and Blocking

Input may be programmed for Free Pass or Blocking.

If the input is programmed for Free Pass, Free Pass Door A or Free Pass Door B then shortage or opening of this input unlocks the corresponding locking device and personnel can pass the door freely.

If the input is programmed for Blocking, then shortage or opening of this input denies access rights to all cards, except those with "Security service" mark.

Locking devices

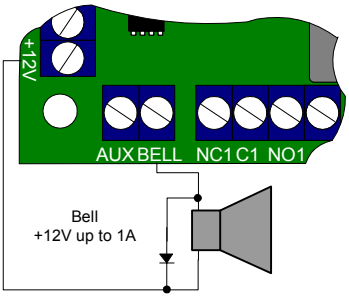


NDC-F16 has two relay outputs with form C contacts. The operation time of these outputs may be programmed from ? to 255 sec, which allows controlling of any type of locking device.

Relay contact rating is 5 Amp @ 24 Volts. Commutation of the inductive load, electric lock for instance, causes high energy electric impulse induced through relay contacts. To save the contacts from damage, protect them with diode, connected in reverse to current supply of the coil.

Note the fact, that some cheap electric door strikes are not intended for been energized for a prolonged time. Program relay time as short as possible to avoid door strike coil overheating.

Sirens, Bells and agents



There are two additional programmable transistor outputs for siren, bell or other agents' control.

Bell output is rated at 0.5A @ 12V and sinks to the ground, additionally it supervises break of the bell connection loop.

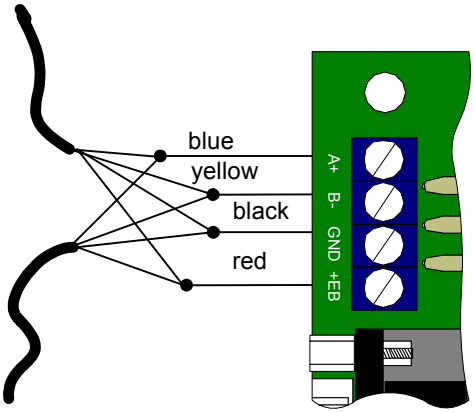
The SW AUX is the energized 12V output, rated at 0.5 A.

These outputs are electronically protected against overload. In case of overload the corresponding event is generated.

Some sirens require polarity observing.

Often Electric bells are the inductive load for power supply. Connecting the bells observe the warning about the inductive load above.

RS-485 Interface



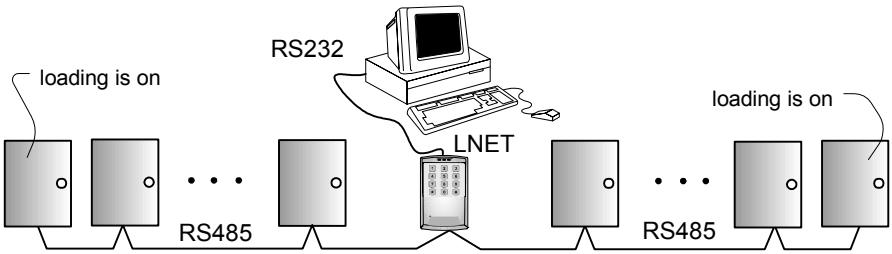
RS-485 Interface is used for networking of the system components - PC and panels. The range of RS-485 bus is up to 1200 meters. The number of devices is up to 32.

RS-485 port is protected against overvoltage (60 V) and crosspolarity.

The unshielded four-wire cable may be used for RS-485 wiring. For maximal range of 1200 meters please use 0.4 mm2 cross section wire. 0.2 mm2 cross section wire will provide the range of 500 meters.

On the first and the last panel in the dropline short jumpers S3, S4 and S6 to add the loading resistor:

Take care of proper grounding of all panels in the network.



Address settings

Each panel on RS-485 dropline must have the unique address from 0 to 31. To adjust the panel address, use the jumpers set S2.

Address	Jumpers					
	S2.1	S2.2	S2.3	S2.4	S2.5	S2.6
0	+	+	+	+	+	Future used
1	-	+	+	+	+	
2	+	-	+	+	+	
3	-	-	+	+	+	
4	+	+	-	+	+	
5	-	+	-	+	+	
6	+	-	-	+	+	
7	-	-	-	+	+	
8	+	+	+	-	+	
9	-	+	+	-	+	
10	+	-	+	-	+	
11	-	-	+	-	+	
12	+	+	-	-	+	
13	-	+	-	-	+	
14	+	-	-	-	+	
15	-	-	-	-	+	
16	+	+	+	+	-	
17	-	+	+	+	-	
18	+	-	+	+	-	
19	-	-	+	+	-	
20	+	+	-	+	-	
21	-	+	-	+	-	
22	+	-	-	+	-	
23	-	-	-	+	-	
24	+	+	+	-	-	
25	-	+	+	-	-	
26	+	-	+	-	-	
27	-	-	+	-	-	
28	+	+	-	-	-	
29	-	+	-	-	-	
30	+	-	-	-	-	
31	-	-	-	-	-	

"+" - jumper is shorted;

"-" - Jumper is open

Limited Warranty

Integrated Technical Vision Ltd. warrants that for a period of eighteen months from the date of purchase, the product shall be free of defect in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, Integrated Technical Vision ltd shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not damaged incurred in shipping or handing, or damaged due to causes beyond the control of Integrated Technical Vision Ltd. such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Integrated Technical Vision Ltd. This warranty contains the entire warranty. Integrated Technical Vision Ltd neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any warranty or liability concerning this product.

In no event shall Integrated Technical Vision Ltd be liable for any direct, indirect or consequential damages. Loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.